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REMARKS

[1-2] Claim 2 was rejected under § 112, second paragraph. This claim is amended as suggested by the Examiner. Withdrawal of the rejection is requested.

[3-5] Claims 1-5 as were rejected under § 103 being unpatentable over Gupta '821 in view of Moslehi '385. This rejection is respectfully traversed. Amended claim 1 reads,

*1. A method of forming a dummy wafer comprising:
providing a dummy wafer having a front surface and a back surface;
forming a masking film on the back surface of the dummy wafer;
spray coating aluminum on the front surface of the dummy wafer so as to
form an aluminum film;
spray coating a covering material on the aluminum film so that the
aluminum film is completely covered by a covering film; and
removing the masking film.*

(1) The present invention relates to a dummy wafer which is used during in-line cleaning (second paragraph of "Description of the Related Art"). The use of a dummy wafer, and the requirements for a dummy wafer, are much different than those of a regular wafer. Instead of controlling micro-currents as a regular wafer does, a dummy wafer serves to protect the wafer area of a plasma chamber. Its main requirements are to resist plasma chamber cleaning gases, and to be inexpensive.

The cited references do not relate to a dummy wafer but instead relate to a normal or processed wafer. With respect, their teachings are not applicable to the Applicants' claims

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because ordinary wafers have different requirements and objects and therefore references disclosing processed wafers do not teach anything about dummy wafers.

Furthermore, no combination of the references could reach the claims because neither discloses a dummy wafer.

(2) Gupta discloses metal sputtering (Abstract, line 6; col., line 62; col. 2, lines 4-5, 10, and 66; col. 2, lines 41 and 63; col. 4, line 2; and col. 4, lines 44 and 48 (claim 1)).

The Examiner asserts (page 3, lines 5 and 7) that the Applicants' claimed spray coating (or thermal spray) is the same as sputtering. With respect, this is incorrect. Sputtering is a method of depositing an **ionized material**, by bombarding a target material with ions. Thermal spray is a method of depositing a **fused material**, by heating the material.

A ceramic can be formed on a wafer by thermal spraying (disclosed in, for example, USP 6,960,395). However, ceramic cannot be formed by sputtering.

Moslehi discloses no metallic layers and therefore also fails to disclose metal sputtering. As neither reference discloses metal sputtering, the instant claims cannot be reached.

(3) As stated above, aluminum oxide, which is a ceramic, cannot be formed by sputtering. Gupta discloses that its oxidized aluminum layer 17 is formed by oxidation (see col. 3, lines 49-51), and Gupta does not disclose spray coating of a ceramic covering material. Moslehi also fails to disclose spray coating. Neither reference discloses spray coating of a ceramic or other covering film.

(4) Moslehi discloses that both sides of the wafer are covered with silicon nitride (col. 2, lines 25-30 and 60-61). Moslehi is applied for disclosing photoresist 12 which protects the backside nitride layer during plasma etching of the frontside (Action at page 3, line 12; Moslehi at col. 2, lines 31-35 and col. 3, line 6). However, no photoresist is needed if plasma etching is done on the front side only (col. 3, line 7).

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Gupta discloses that its aluminum layer protects the substrate from the copper which is coated onto the frontside; the copper, which is for "plugs, lines, bonding pads, etc.", would migrate into the substrate if not for the aluminum (see col. 3, lines 8-12). After the copper is laid down, semiconductor devices are formed on the frontside (col. 3, line 17).

Moslehi is concerned only with the thermal properties of the wafers, and Gupta is concerned with preventing copper from diffusing into a silicon substrate. The references have different objects, as well as different disclosures, and therefore the person of ordinary skill would not have combined them.

The Applicants respectfully submit that the references themselves do not suggest combination. If Gupta's layer of copper-getter aluminum *were* removed by plasma etching¹ during processing to form semiconductor devices, then this would make no difference (and therefore provide no advantage), because the copper-coating step would already be over and the copper would be removed along with the aluminum into which it was gettered.

Thus, Moslehi's resist 12 would not be useful to Gupta. With respect, the Examiner's asserted motivation, "to protect the wafer surface during wafer processing," is not supported by the references (no citation is made to them) or by reasoned argument.

[6] Claims 6 and 7 were rejected under § 103 as being unpatentable over Hsu '452 in view of Lawrence '875. This rejection is respectfully traversed as to claim 6 (claim 7 is canceled without prejudice) for the reasons presented below.

Amended claim 6 reads,

¹ The record does not show whether or not plasma etching will remove aluminum.

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6. A method of forming a dummy wafer comprising:
processing aluminum into a wafer shape to provide an aluminum dummy wafer having a front surface and a back surface;
polishing the front surface of the aluminum dummy wafer;
attaching an electrode to a part of the back surface of the aluminum dummy wafer;
covering the back surface with a masking film except the electrode;
applying anodic oxidation to the aluminum dummy wafer so as to form an aluminum oxide film on the front surface of the aluminum dummy wafer;
removing the electrode and the masking film; and
applying mirror polishing to the back surface of the wafer after removing.

(1) Even if the references were combined (not admitted), they would still not disclose the other features now claimed, such as *attaching an electrode ... covering the back surface with a masking film except the electrode* (no electrodes or masking films are seen in either reference), or the order of the claim steps (polishing the front; oxidizing the front; polishing the rear after removing)

(2) As discussed above, the present claims relate to a dummy wafer, and this is not disclosed by either of the references. Hsu does not even disclose a wafer of any sort, or mention wafer technology or electronics; Lawrence is directed toward reclaiming of a conventional processed wafer by polishing the backside, which is then used as an area for forming new active devices. Lawrence does not mention or suggest dummy wafers.

(3) Assuming that Hsu disclosed an aluminum wafer (it does not), the grinding and polishing disclosed by Lawrence would destroy the protective coating that Hsu would have added to it, and that protective coating is the object of Hsu (e.g., ¶¶ [0012]-[0013]).

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Conversely, Lawrence's polishing would not be applied to an aluminum wafer (none is disclosed) because Lawrence's object is to re-use a *silicon* wafer, on which new active devices can be fabricated. An aluminum wafer is, of course, completely useless for fabricating new transistors and the like.

Combining the references would destroy their functions. Therefore, combination is not suggested.

Furthermore, the person of ordinary skill would never have even considered combining these two references. Hsu is directed to a protective and decorative surface for any aluminum object, while Lawrence deals with rebuilding used silicon wafers and, if there were any aluminum on the wafer, it is ground to dust and washed away during the process of Lawrence. The Applicants see no reason why the person of ordinary skill have taken, e.g., a blue anodized aluminum lawn chair or other such aluminum item, and polished the back side.

The Examiner asserts (page 4, line 8), as motivation, applying mirror polishing for the purpose of producing a mirror-like finish. This is respectfully submitted to be a tautology, and not any reason that would actually have motivated the person of ordinary skill to mirror-finish an aluminum object with a decorative finish.

[7] Claims 6 and 7 were rejected under § 103 as being unpatentable over Dickey '603 in view of Lawrence. This rejection is respectfully traversed as to claim 6; claim 7 is canceled without prejudice.

(1) Claim 6 is now amended to include processing aluminum into a wafer shape to provide an aluminum dummy wafer. This processing step is not disclosed in Dickey or Lawrence. Dickey does not disclose an aluminum wafer, only an aluminum film formed on the surface of a *silicon* wafer (e.g., col. 3, line 18) with the purpose of providing a capacitor to work

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there with silicon devices such as transistors. Dickey inherently teaches against substituting aluminum for silicon, because it would short out all of the other devices.

(2) The Applicants respectfully traverse the asserted motivation for combining the references (Action at page 5, sixth line from bottom), on the grounds set out above with regard to the rejection over Hsu. There is no apparent reason why the person of ordinary skill would have polished the backside of a wafer, just because an aluminum-film capacitor had been formed on the front.

[8] Claim 8 was rejected, but this rejection is moot as claim 8 is canceled without prejudice.


New independent claim 14 is patentable for the reasons set out above in regard to the other two independent claims.

The dependent claims not discussed individually are patentable, *inter alia*, by their dependence from allowable claims.

Withdrawal of the rejections and allowance are requested.

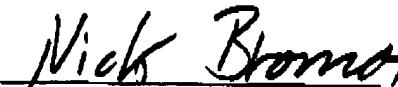
Respectfully submitted,

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Date


Nick Bromer (Reg. No. 33,478)
(717) 426-1664
RABIN & BERDO, P.C.
CUSTOMER NO. 23995
Telephone: (202) 371-8976
Telefax : (202) 408-0924

I certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office (fax no. 571-273-8300) on December 17, 2005.

Nick Bromer [reg. no. 33,478]

Signature 

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